DOCKET FILE COPY ORIGINAL
RECEIVED
AUG 28 1998
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D. C. 20554

In the Matter of:	)	
	)	
Federal-State Joint Board on Universal Service	)	CC Docket No. 96-45
	)	CC Docket No. 97-160
	)	DA 98-1587
Forward-Looking Mechanism for High Cost Support for Non-Rural LECs	)	
	)	

COMMENTS OF GTE

Gail L. Polivy
GTE Service Corporation
1850 M Street, N.W.
Suite 1200
Washington, D.C. 20036
(202) 463-5214

John F. Raposa
GTE Service Corporation
600 Hidden Ridge, HQE035J27
Irving, Texas 75038
(972) 718-6969

Jeffrey S. Linder
Suzanne Yelen
WILEY, REIN & FIELDING
1776 K Street, N.W.
Washington, D.C. 20006
(202) 429-7000

Its Attorneys

August 28, 1998

TABLE OF CONTENTS

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D. C. 20554

In the Matter of:	)	
	)	
Federal-State Joint Board on Universal Service	)	CC Docket No. 96-45
	)	CC Docket No. 97-160
	)	DA 98-1587
Forward-Looking Mechanism for High Cost Support for Non-Rural LECs	)	
	)	

COMMENTS OF GTE

GTE Service Corporation and its affiliated domestic telephone operating companies (collectively "GTE")[1] respectfully submit their Comments on the Common Carrier Bureau's Public Notice in the above-captioned proceedings.[2] GTE continues to believe that an auction mechanism is the best method for allocating universal service funding. Competitive bidding will allow all carriers the opportunity to provide universal service using any technology, while also ensuring that the carrier selected will provide the most cost-effective service. Until a competitive bidding mechanism can be

---

[1] GTE Alaska, Incorporated, GTE Arkansas Incorporated, GTE California Incorporated, GTE Florida Incorporated, GTE Hawaiian Telephone Company Incorporated, The Micronesian Telecommunications Corporation, GTE Midwest Incorporated, GTE North Incorporated, GTE Northwest Incorporated, GTE South Incorporated, GTE Southwest Incorporated, Contel of Minnesota, Inc., GTE West Coast Incorporated, and Contel of the South, Inc.

[2] Common Carrier Bureau Requests Seeks Comment On Model Platform Development, CC Docket Nos. 96-45, 97-160 (Public Notice) (rel. Aug. 7, 1998) ("Public Notice"). GTE's proposal in these comments in no manner prejudices its positions set forth in its appeal of the Commission's universal service order. *See Texas Office of Public Utility Counsel v. FCC*, No. 97-60421 (5h Cir.) (*"Texas Ofc. Of Pub. Util. Counsel"*).

established, the most accurate method of determining universal service costs is carrier-specific models. However, if the Commission does adopt a cost proxy model, GTE urges the Commission to include the recommendations outlined below so as to ensure that the model accounts for the costs of providing universal service as accurately as possible.

I. INTRODUCTION AND SUMMARY

In its Public Notice, the Bureau states that:

> Three models have been submitted to the Commission for consideration as the platform for the federal mechanism: the Benchmark Cost Proxy Model (BCPM), the HAI Model (HAI), and the Hybrid Cost Proxy Model (HCPM). These models have been subject to extensive review by Commission staff and outside parties, and thousands of pages of comments have been filed regarding their relative merits and problems.[3]

This is not entirely correct. Both the HAI Model and BCPM have gone through numerous iterations and have been commented upon extensively by interested parties. However, the HCPM version under review in these comments was only released July 20, 1998. With few exceptions,[4] there has been no public comment on this version of HCPM. Further compounding this problem is the fact that the documentation

---

[3] Public Notice at 1 (footnote omitted).

[4] The only comment of which GTE is aware is an ex-parte submission made by the BCPM Sponsors on July 31, 1998 which noted numerous problems with HCPM.

accompanying the Model is insufficiently detailed to answer many of the basic questions that are critical to a thorough analysis.[5]

Because HCPM's customer location and outside plant methodology could significantly influence the platform ultimately selected by the Commission, a much more extended review of the Model is required. In particular, because HCPM is not a complete model,[6] several issues need to be explored concerning how HCPM would interact with parts of other models and whether the choice of HCPM would foreclose certain models because of incompatibilities. In addition, HCPM has been populated with test data only. External validation, comparing a model's output to verifiable, real-world data, is essential in evaluating its merits.[7] By furnishing a model with test data only, the Commission has made it impossible for parties to validate HCPM's output and has limited parties to providing comment on its theoretical structure. Geocoded data representing other companies and jurisdictions are required in order to do a thorough review of the model and perform model validation analysis. Therefore, although GTE provides some comments on HCPM below, it urges the Commission to release

---

[5] For example, as explained in Section II.D below, the HCPM documentation does not make clear if it takes into account all housing units, all occupied households, all houses with telephone service, or some other variation.

[6] The failure of HCPM to meet the Commission's criteria is discussed in Section IV.A.

[7] The Commission's staff has noted that external validation can be important. Jay Atkinson, Chris Barnekov, David Konuch, William Sharkey, and Brad Wimmer, "The Use of Computer Models for Estimating Forward-Looking Economic Costs – A Staff Analysis," at 6 (Jan. 9, 1997) (stating that "[i]t may also be instructive to compare estimates calculated by the models with data from Automated Record Management Information Systems ('ARMIS')").

additional information so interested parties will have the opportunity to conduct a full evaluation similar to that done for the HAI Model and BCPM.

Based on its review of the HAI Model, BCPM, and HCPM, if the Commission does select a cost proxy model, GTE submits that the model platform for the customer location and outside plant modules should be consistent with the following. First, the customer location methodology should not incorporate any algorithms or data sources that have been shown to be of questionable accuracy in this proceeding. In this regard, the HAI model uses a surrogate method that uniformly assigns non-geocodable locations along the periphery of the census block. This approach is highly inaccurate because it does not consider any information other than the census block where the customer is located. The BCPM model, on the other hand, has a customer location algorithm that uses housing and business line data at the CB level combined with information on road networks. The Model then clusters customers in urban and sparsely populated areas, incorporating the fact that telephone networks are built based on Carrier Serving Areas, not on a customer-by-customer basis.[8] Doing so produces more accurate results than HAI.

Second, the Commission's model should use a grid-based platform for the development of a distribution network, such as that incorporated in BCPM. Third, unlike the network currently modeled by HCPM, the Commission's model must be consistent with the deployment and delivery of advanced services to customers in all areas of the

[8] Comments of GTE, CC Docket Nos. 96-45, 97-160 at 6-7 (filed June 1, 1998) ("GTE Comments (June 1, 1998)")

country. Fourth, the model must efficiently process the necessary data and algorithms. Use of an unnecessarily difficult programming language or long processing times can impede the evaluation of the model and its results. Finally, the other model elements, such as switching, transport, and expense, should be calculated using the BCPM methodology. A cost proxy model incorporating these elements, though not as accurate as a carrier-specific model, will combine the best elements of the models the Commission has examined.

II. CUSTOMER LOCATION SHOULD BE DETERMINED USING THE MOST ACCURATE AVAILABLE DATA.

The best method of determining customer location for a cost model uses the most accurate sources of information and algorithms available. Because reliable geocoded data are the best method for locating customers,[9] such data should be used for those wire centers that meet a minimum threshold of accuracy and completeness. Where accurate geocoded data are not available, the BCPM methodology should be used to locate customers along the road network. Finally, a well-defined process to supplement the accuracy of existing geocoded data should be implemented along with an appropriate cost-recovery mechanism.

Although GTE supports a combination of methods for determining customer location, this approach will require complex programming that could cause some difficulties. For example, it may be difficult to develop a model that can use geocoded

[9] As GTE has noted in its prior pleadings, there are substantial problems with the geocoded data currently used by the HAI Model. GTE Comments (June 1, 1998) at 3-5.

data and customer locations determined by the BCPM methodology within a single wire center. In addition, a platform using a variety of methodologies may have excessive run-times, making it impractical for use in determining costs. Moreover, great care must be taken to insure that the different customer location methodologies work independently of each other, do not change the results of the customer locations produced by each method, and do not place more than one customer at the same location.

A. Geocoded data used in a cost model must be shown to be reliable.

The Bureau seeks comment on how a model platform should use the most accurate customer location data available and how the costs associated with geocoded data should be recovered.[10] As GTE has explained previously, high-quality geocoded data are currently not available, and considerable additional expense and effort *are needed to compile the information necessary for use in a cost model. GTE has also shown that the customer location data used in the HAI Model 5.0a, derived from the Metromail and Dun & Bradstreet databases, are not open for public inspection and there is substantial evidence that they are unreliable. For example, GTE has shown that street segments often lack uniform range numbers, exact city boundary lines do not exist for all areas, many major highways do not have segment information, and rural

[10] Public Notice at 3.

route and post office box addresses, even if properly geocoded, do not necessarily correspond to actual customer location.[11]

Because of the significant benefits of geocoding, any potential data sources must be carefully reviewed, validated, and made available for public scrutiny.[12] The quality of the database, such as error rates, duplication, and completeness, are of critical importance and particular attention must be paid to post office boxes and rural routing addresses. GTE urges the Commission to make available for public comment as soon as possible any geocoding databases under consideration.[13]

---

[11] Comments of GTE, CC Docket Nos. 96-45, 97-160 at 4-5 (filed June 1, 1998) ("GTE Comments (June 1, 1998)"). As explained below, GTE urges the Commission to develop a process to collect accurate geocoded data. Because customer location does not correspond to mailing addresses for post office box and rural route customers, geocoded data from global positioning devices is particularly critical for these customers.

[12] Although the Commission has made clear that it believes the HAI Model contains confidential data, AT&T and MCI continue to deny this and refuse to make it available to GTE as required by the Commission's Protective Order. *See* Protective Order, CC Docket Nos. 96-45, 97-160 (rel. July 27, 1998) (providing procedures for viewing of confidential information and noting that both the HAI Model and BCPM "have increasingly relied upon software and databases that are confidential"); Letter from Mary J. Sisak (MCI) to Gail L. Polivy (GTE) (Aug. 14, 1998) (stating that AT&T and MCI have not requested confidential treatment of any materials under the FCC's Protective Order).

[13] GTE recognizes that some of these databases may be proprietary. However, the Commission can make them available for public inspection subject to the confidentiality mechanisms already established in this docket.

B. For areas where accurate geocoded data are not available, the BCPM algorithm should be used to locate customers.

GTE recognizes that geocoded data potentially are the most accurate method of determining customer location. For locations that cannot be accurately geocoded, the BCPM methodology of locating customers along roadways should be used as a surrogate customer location methodology. To the extent that both methodologies can be used within a wire center without compromising the integrity of the customer location data or excessively increasing model processing time, the most accurate results could be obtained by using the available geocoded data in combination with the BCPM methodology for all other customers. If, however, the use of both methodologies within a single wire center causes a significant difference in model processing time, a threshold should be adopted for each wire center that requires a minimum level of accuracy among the geocoded data or the BCPM methodology is used for the entire wire center.

If a threshold is necessary, GTE's internal data and data obtained from PNR (see Exhibit 1) show a significant drop in the geocoding success rate for wire centers with fewer than 20,000 lines. Therefore, GTE recommends that for wire-centers with line counts exceeding 20,000 a combination of geocoded data and BCPM methodology should be used. The remainder of the exchanges, those with less than 20,000 lines, would have customer location determined using solely the BCPM methodology.

C. A process for collecting accurate geocoded data should be implemented as soon as possible.

Because customer location is one of the most critical factors for determining the cost of providing telephone service, it is imperative that the currently available data be supplemented and improved. As GTE noted in its prior comments, this is an expensive and resource-intensive process if undertaken solely by ILECs.[14] However, it becomes a more manageable and less expensive task if undertaken in combination with local utilities, such as water and electric companies. Since these utilities must read meters at customer premises on a monthly basis, the cost of acquiring geocoded data can be significantly reduced by using the meter reading process already in place. By providing meter readers with global positioning devices and paying a reasonable fee to the utility, reliable geocoded data can be collected in a timely and more cost-effective manner.

The accumulation and processing of the geocoded data could be awarded under one contract (thus minimizing costs through volume) or performed at the federal level. In order for ILECs to undertake the expense of coordinating the accumulation of this data, the Commission must ensure that the costs of collecting these data are completely covered by the universal service fund. GTE recommends that these costs be considered part of the administrative expenses associated with universal service funding and should be recovered in the same way as other administrative expenses.

---

[14] GTE Comments (June 1, 1998) at 7-8.

D. Any cost model must calculate the costs of serving all housing units.

As GTE has explained, ILECs are carriers of last resort, and as such, are responsible for providing service to all customers in the local exchange within a reasonable period of time.[15] Therefore, the model selected by the Commission must consider the costs of serving all housing units within the ILECs territory. Unfortunately, the HCPM documentation does not make clear whether HCPM considers all housing units in a given area. GTE urges the Commission to release sufficient information for interested parties to determine whether HCPM adequately considers the costs ILECs incur in being ready to provide service to all customers.

III. THE HCPM CLUSTERING ALGORITHM MAY PROVIDE A USEFUL BASIS FOR DEVELOPING A CUSTOMER LOCATION MODULE.

The Bureau requests comment on the relative merits of the HAI and HCPM clustering mechanisms.[16] As GTE has explained in prior pleadings, the HAI clustering mechanism creates artificial groupings of customers and diminishes the accuracy of geocoded data.[17] As a result, the HAI Model reduces actual customer dispersion and underestimates the amount of distribution cable necessary to serve customers. As explained in Exhibit 2 attached hereto, a detailed analysis of the HAI clustering

---

[15] GTE Comments (June 1, 1998) at 8-9.

[16] Public Notice at 3-4.

[17] GTE Comments (June 1, 1998), Exhibit 1.

mechanism shows that it could not possibly compute the amount of distribution cable necessary to ensure that all customers are able to connect to the telephone network.

In contrast, HCPM seems to make much better use of the geocoded data. The model provides a choice of three algorithms: divisive, agglomerative, and nearest neighbor. However, these are only three of the numerous clustering mechanisms that may be applicable. A comparison of the three clustering mechanisms using a random sample of wire centers included in HCPM shows that they produce significantly varied model results:

Number of Clusters by Clustering Algorithm

Wire Center	Divisive	Agglomerative	Nearest Neighbor
ABRDMDAB	17	14	12
BRKLMDBK	35	22	24
CLPKMDBW	49	30	31
DRCRMDDC	14	9	10
GLVLMDGL	23	15	16
KTZMMDKM	8	7	7
NNTCMDNT	7	8	9
PKTNMDPK	10	16	11
SLSPMDNB	24	16	15
TWSNMDTW	62	37	38

The HCPM model developers state that the divisive algorithm is most appropriate because "it tends to create the smallest number of clusters and is also by far the most efficient algorithm in terms of computer run-time."[18] As shown in the table above, GTE's own analysis does not confirm this result: the divisive algorithm produced more clusters in most cases than the other algorithms and took approximately

[18] C.A. Bush, D.M. Kennet, J. Prisbrey, W.W. Sharkey, Vaikunth Gupta, "The Hybrid Cost Proxy Model Customer Location and Loop Design Modules, at 6 <http://www.fcc.gov/Bureaus/Common_Carrier/Other/hcpm/>.

the same run-time. Further, although small numbers of clusters and efficient run-time may make a model easier to use, the most important factor in choosing a clustering mechanism must be accuracy. GTE urges the Commission to ensure that all clustering mechanisms, including those not considered by the HCPM developers, are thoroughly tested and compared based on accuracy of the results produced before a final decision is made.

IV. SEVERAL ASPECTS OF HCPM REQUIRE ADDITIONAL REVIEW AND CONSIDERATION.

Although HCPM seems to have some advantages over the other proxy models the Commission has considered, it has not undergone the same rigorous scrutiny as the other models. In addition, because it is not a complete model, HCPM must be examined to determine how it will work with parts of other models the Commission has considered. Since the most recent version of HCPM has only been available for public review since July 20, GTE has been unable to complete a thorough examination. However, its initial comments on several aspects of the Model are addressed below.

A. HCPM is not a complete model and does not meet the Commission's criteria.

In its Universal Service Order, the Commission outlined several criteria that cost models must meet. HCPM does not even attempt to model all of the costs of providing universal service and fails to meet several of the Commission's criteria. Further study is necessary to determine whether HCPM can be modified and combined with other cost models to cure these problems.

The Commission's first criterion requires that "[t]he loop design incorporated into a forward-looking economic cost study or model should not impede the provision of advanced services....[and] [w]ire center line counts should equal actual ILEC wire center line counts."[19] HCPM does not meet this standard. First, it impedes the deployment of advanced technologies by calling for the use of copper T-1 technology. T-1 technology in today's network is largely outdated and only used for limited purposes.[20] Furthermore, T-1 technology is not compatible with ADSL and other digital subscriber line technologies. Second, the wire center line count used in HCPM does not equal the ILECs' wire center line count.

HCPM also does not meet the Commission's second criterion: "[a]ny network function or element, such as a loop, switching, transport, or signaling, necessary to produce supported services must have an associated cost."[21] HCPM accounts for only some network costs and omits large numbers of network functions and elements. The current version of the Model does not even include all the components for the local loop. For instance, it does not account for:

- manhole, handhole and pullbox investment;
- NID investment;
- drop and drop terminal investment;
- DLC terminal office investment;
- OSS cost;
- switch costs;

---

[19] In the Matter of Federal-State Joint Board on Universal Service, Report and Order, 12 FCC Rcd 8776, 8913 (1997) ("Universal Service, 12 FCC Rcd").

[20] GTE Comments (June 1, 1998) at 9-13.

[21] Universal Service, 12 FCC Rcd at 8913.

- signaling costs;
- operating expenses; and
- general support expenses.

In addition, the Commission's seventh criterion requires that "[a] reasonable allocation of joint and common costs must be assigned to the cost of supported services."[22] However, HCPM currently does not account for common costs and thus does not meet this criterion either.

To ensure that all parties could provide meaningful comment on the proposed cost models, the Commission's eighth criterion requires that "[t]he cost study or model and all underlying data, formulae, computations, and software associated with the model must be available to all interested parties for review and comment. All underlying data should be verifiable, engineering assumptions reasonable, and outputs plausible."[23] Because of the limited data available, the incompleteness of the Model documentation, and the difficulty of reading the Model code, GTE believes that HCPM fails this criterion at this time.

Although HCPM does not meet all of the Commission's criteria, it is possible that it could comply if modified and combined with other models. For example, as explained below, the Model could use actual wire center line counts rather than proxy line counts. In addition, for those network elements and functions not included in HCPM, GTE recommends the use of BCPM. The BCPM methodology for switching, transport, and

---

[22] Universal Service, 12 FCC Rcd at 8915.

[23] Universal Service, 12 FCC Rcd at 8915.

expense could likely be combined with the HCPM customer location and clustering methods to form a more complete model meeting all of the Commission's requirements.

B. HCPM's optimization techniques have not been fully tested and may not account for the real-world costs of building a network.

GTE has identified several optimization techniques within HCPM. First, the Model optimizes the layout of the feeder by using a modified version of Prim's algorithm. The Model user is provided with two options: calculation of the minimum distance using airline distance or rectangular distance. Calculating a minimum spanning tree ("MST") using airline distance, the shortest distance between two points, is unrealistic. Real-world providers must work around physical obstacles, such as rivers, mountains, lakes, and freeways. They must also contend with limited rights-of-way. These factors often prevent a carrier from installing cable along straight (airline) distances.

Therefore, without "grossing-up," an airline distance MST does not represent the actual amount of cable (route miles) that is needed to connect customers to the network. The Model, at a minimum, must use the rectangular distance, which implies a gross-up factor of at most 1.41 over the airline MST. If the Commission chooses to use the airline MST, GTE recommends that HCPM incorporate different ratios from 1.3 to 2.0 for different density zones, with lower ratios in low-density zones and higher ratios in urban areas.

Second, HCPM optimizes the trade-off between distribution plant, feeder plant, and loop electronics in several ways. For example, the Model calculates the cost minimizing number of SAIs and T-1 terminals. Although GTE does not object to this process, the Model must take into account that this is often not possible under real-world conditions. Carrier engineers attempt to minimize the number of SAI terminals by predicting future demand. Since a network is built in increments and actual demand often does not evolve in the same manner as predictions, it is usually impossible for carriers to achieve the most efficient network layout. To account for these real-world conditions, GTE recommends the use of a gross-up factor.

Third, the HCPM developers claim to use "an algorithm developed for network planning purposes in both feeder and distribution segments."[24] The documentation does not make clear what algorithms are being referenced or how they were implemented in the Model. More information is necessary for interested parties to comment fully on these optimization techniques.

Finally, HCPM selects technologies on the basis of annual cost factors. However, the selection of technologies on the basis of annual cost factors alone does not ensure the most efficient, cost-effective technology in the long run. There are tradeoffs between capital expenditures and operating expenses that must be considered by a carrier designing an efficient network. For example, terrain and/or weather conditions in a particular area may make buried plant most efficient in the long run because of the high maintenance requirements of aerial plant, but aerial pant may be the least expensive when first installed. In addition, carriers often cannot achieve minimum costs under real-world conditions for reasons unrelated to efficiency. For

---

[24] HCPM Model Documentation, *supra* note 18, at 4.

instance, in many customer serving areas, local ordinances require minimal usage of aerial plant, regardless of cost. Any model attempting to optimize annual cost factors must consider both long run costs and real-world conditions that constrain carrier efficiency.

To evaluate fully HCPM's optimization algorithms, a sensitivity analysis must be conducted on each of the choices provided by the Model. However, because of the sparse documentation and the HCPM's lengthy run-time, this was not possible in time for the completion of these Comments.

C. Although HCPM's distribution architecture is significantly better than that in the HAI Model, it does not account for all network components.

HCPM's distribution architecture consists of clusters that in turn consist of microgrids. Within a microgrid, customers are distributed uniformly. To determine the appropriateness of such dispersion, a MST test, similar to the one performed on the HAI model, should be performed on this type of architecture. Despite the need for further analysis, HCPM's approach is clearly an improvement over the HAI Model's clustering approach. By using microgrids, as BCPM does, HCPM likely avoids the problem of inaccurately reducing customer dispersion by grouping customers in rectangular clusters that plagues the HAI Model. In addition, unlike the HAI Model, HCPM seems to bring the network to the customer locations rather than moving the customers to the network. However, HCPM omits a number of network components that must be included to produce reasonably accurate cost estimates. For example, it does not account for manholes, pullboxes, and handhole investment.

D. Although the general layout of HCPM's feeder module is reasonable, some costs may be underestimated or omitted.

In general, GTE agrees with HCPM's treatment of feeder plant. However, as noted above, GTE objects to the use of airline distances without appropriate grossing-up because the actual amount of feeder plant will be underestimated because of real-world construction factors. In addition to underestimating the amount of cable needed to provide service, HCPM may have some other inconsistencies and possible errors. First, the number of total lines reported is always significantly greater than the sum of residential, business, special access, and public lines used by the Model. The reasons for and the effects of this inconsistency are not clear at this time. Second, although HCPM recognizes the use of DLC lines and differentiates between copper and fiber feeder structures, a possible Model error causes the feeder placement cost to be double-counted. Thus, a service area served by copper feeder is assigned copper feeder placement cost and duplicate cost for fiber feeder placement cost. The Model also seems to double-count for service areas served by fiber feeder. Third, while aerial feeder cable costs are included in the Model, aerial feeder placement costs are not, which prevents these costs from being included in HCPM's results.

E. HCPM has insufficient documentation, is difficult to use, and has an extremely long run-time.

Because of several problems with HCPM's documentation and with the Model itself, it is difficult, if not impossible, to do a complete review. One problem is that the documentation included with the Model does not provide sufficient explanation and is often inconsistent with the Model. For example, the user-adjustable inputs in HCPM are not fully explained and in several instances the documentation contains different values than are actually used in the Model. In addition, HCPM is currently written in Turbo Pascal. As the modelers admit, this is a "high level" programming language that is not commonly used. To analyze the Model fully, the code must be reviewed to check for possible modeling or algorithmic errors. Since a full review and understanding of the programming code is crucial for a thorough evaluation, GTE recommends the use of a more common programming language such as Visual Basic.

Another difficulty with HCPM is its run-time. HCPM's running time for its sample data (Bell Atlantic Maryland on surrogate customer data) is between 10-20 hours. This limits parties' ability to make sensitivity runs and test various assumptions.[25] While accuracy should not be sacrificed to reduce run-time, every effort should be made to minimize the Model's run-time. For example, the Model's code does not seem to be written as efficiently as possible, and a simplification could reduce run-time without reducing accuracy. Moreover, the program code has some freezing difficulties when Windows NT is used and does not run to completion without user intervention on Windows 95.

Further, the computer hard-disk space requirements for HCPM are enormous. The database for one carrier for one state is approximately 20 megabytes in size. The database for the entire nation will be in excess of 1-2 gigabytes, which would make the Model difficult to use, analyze and validate. To remedy these problems, GTE suggests

---

[25] Running the model on a smaller set of data will not provide insight to the full effect of the modification and might therefore be misleading.

that the Commission discuss the development of the database and the clustering algorithm separately from the remaining issues. This would allow the parties to "preprocess" the database and compute the cost estimates based on this pre-determined database.

F. HCPM should use actual wire center boundaries and line counts.

HCPM utilizes the On-Target database to determine wire center boundary lines. It is GTE's belief that this database contains numerous inaccuracies and is not reliable. To improve accuracy, HCPM should use actual wire center boundaries, which are available from each state commission. However, if the Commission chooses not to use actual wire center boundaries, GTE recommends the Business Location Research (BLR) database, which is significantly more accurate than On-Target. Similarly, HCPM should incorporate actual wire center line counts, as required by the Commission's own criteria, rather than using proxies. The Commission has recently collected this information as part of its universal service proceeding and could easily incorporate such information into a model with appropriate confidentiality restrictions.

V. CONCLUSION

GTE has explained consistently throughout this proceeding that an auction mechanism is the most efficient method of allocating universal service funding while minimizing costs and not favoring one technology over others. Carrier-specific models are the best method of allocating funding until an auction mechanism has been implemented. However, if the Commission chooses to use a cost proxy model, it should select a model that uses the most accurate information available and takes into account all of the costs of providing universal service.

Respectfully submitted,

GTE SERVICE CORPORATION and its affiliated domestic telephone operating and wireless companies

By: ______________________

Jeffrey S. Linder
Suzanne Yelen
WILEY, REIN & FIELDING
1776 K Street, N.W.
Washington, D.C. 20006
(202) 429-7000

Gail L. Polivy
GTE Service Corporation
1850 M Street, N.W.
Suite 1200
Washington, D.C. 20036
(202) 463-5214

John F. Raposa
GTE Service Corporation
600 Hidden Ridge, HQE035J27
Irving, Texas 75038
(972) 718-6969

Its Attorneys

August 28, 1998

EXHIBIT 1

GEOCODING SUCCESS BY WIRECENTER LINES